Phosphoric Acid, Tris(methylphenyl)ester - Comments of Environmental Defense

(Submitted via Internet 4/25/02)

Environmental Defense appreciates this opportunity to submit comments on the robust summary/test plan for Phosphoric acid, tris(methylphenyl)ester CASRN 1330-78-5.

Phosphoric acid, tris(methylphenyl)ester is a mixture of organophosphate chemicals consisting of triortho-, trimeta-, tripara- and mixed tricresyl phosphates. It is referred to by a dozen or more synonyms, most of which are not given in this report. However, it is most commonly referred to as tricresyl phosphate. Tricresyl phosphate (TPC) is the synonym used throughout the report and the synonym that will be used here.

The robust summary/test plan indicates a number of SIDS data elements remain to be generated. Specifically, determinations of water solubility photodegradation, stability in water, fugacity, toxicity to plants and studies of developmental toxicity are required. Some of the required data e.g., boiling point and water solubility as well as additional desirable information, e.g., primary uses could also be included to provide a more complete review of available literature.

We have the following additional comments on this report.

1. A more complete list of synonyms for TCP should be provided.

2. TCP is used commercially as a plasticizer for vinyl plastics, as a flame retardant and as a solvent to nitrocellulose. Exposure to high concentrations would be expected to be limited to occupational situations or a spill, but low level consumer exposure could occur through contact with TPC containing plastics. Thus, it would be of public interest to provide information on uses and possible sources of exposure in this report.

3. TPC has been the subject of considerable study because consumption of one isomer, triorthocresyl phosphate (TOCP), has resulted in human toxicity manifest by delayed neurotoxicity as a result of demyelination in the nervous system. The extent of the literature available on TCP is not accurately reflected in this report.

4. TOCP is much more toxic than other isomers in this mixture. Thus, most industrial synthesis endeavors to limit the TOCP in the formulations. This fact is not mentioned in this report. Further, the concentration of TOCP in the various studies of TCP is never given.

5. Many of the studies cited are relatively old and were not conducted under GLP. The fact that studies are old does not mean they are not good studies. However, given the extent of the literature on TCP, it is not clear that the best studies were always cited. Some studies cited present contradictory results. For example, under Section 4.1 Toxicity to Fish, it is difficult to believe that trout are over 100 times more sensitive than"flathead" minnows. (Note: We think the minnows referred to are actually fathead minnows.) A second example of obviously contradictory results is seen on comparing results of repeat dose studies described on pages 16 & 17. One study says no clinical signs suggestive of toxicity in rats were observed at a gavage dose of 1000 mg/kg/day whereas another study reports that when administered at 1.0% on the diet, a comparable dose, virtually all the animals died. These variations could have resulted from varying amounts of triorthocresyl phosphate in the formulations used. If that information is available it should be described.

6. In section 4.2 the amount of acetone used, 200 ml, seems very high. Could it have been 200?l? If indeed 200 ml was used it could have accounted for significant toxicity.

7. We believe the data requested under 4.8 Biotransformation refer to degradation in the environment. The two studies cited here describe metabolism in hens and rats and are presented verbatim again on pages 23 & 24.

8. Section 5.1.2: It is not obvious why an invalid study is cited when a valid study conducted under GLP is also available and listed.

9. The description of studies of genotoxicity using the Ames test do not mention the fact that TCP is toxic to Salmonella. Was toxicity observed in this study? No genotoxicity is seen if the microbes are dead.

10. Section 5.8, Toxicity to Reproduction: One study addresses triorthocresyl phosphate specifically. The fact that this is the most toxic isomer should be made clear. If taken out of context results of this study may exaggerate risks associated with commercial preparations of TCP.

11. Section 5.11: Experience with Human Exposure: There are numerous references to human toxicity resulting from human exposure to TCP containing significant concentrations of TOCP that are not mentioned here. The one study that is cited in this report, a possible example of allergic contact dermatitis associated with the use of bandages, presents no evidence to indicate TCP was involved and should not be cited.

Thank you for this opportunity to comment.

Hazel B. Matthews, Ph.D.
Consulting Toxicologist, Environmental Defense

Karen Florini
Senior Attorney, Environmental Defense